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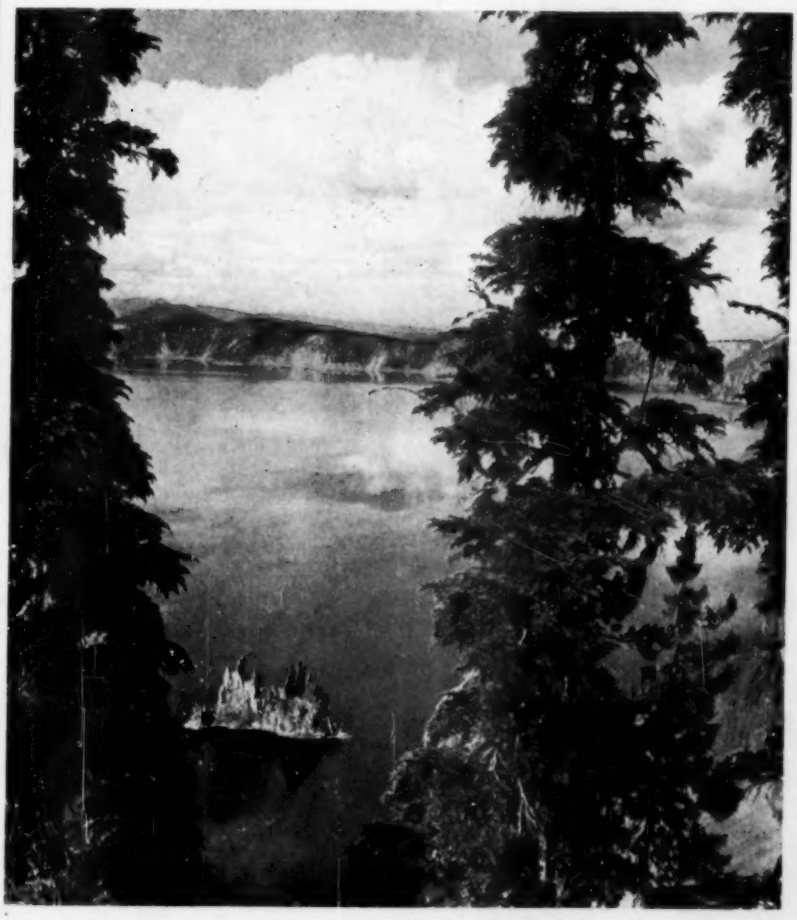
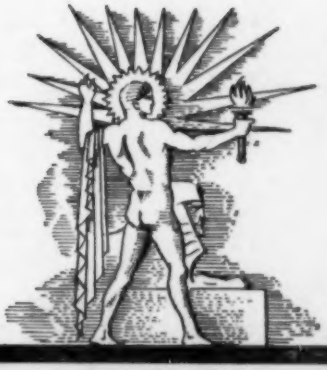
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •





JULY 6, 1935

The Phantom Ship

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A SCIENCE SERVICE PUBLICATION

SCIENCE NEWS LETTER

VOL. XXVIII *No. 743*

The Weekly Summary of Current Science

Published Every Saturday by

SCIENCE SERVICE

THE INSTITUTION FOR THE POPULARIZATION OF SCIENCE organized 1921 as a non-profit corporation, with trustees nominated by the National Academy of Sciences, the National Research Council, the American Association for the Advancement of Science, the E. W. Scripps Estate and the journalistic profession.

Edited by WATSON DAVIS

Subscription rates—$5.00 a year postpaid; two years $7.00; 15 cents a copy. Ten or more copies to same address, 5 cents a copy. Back numbers more than six months old, 25 cents.

Canadian subscribers please add 50 cents a year, foreign subscribers 75 cents a year to regular subscription rate to cover postage.

Members of the American Association for the Advancement of Science have the privilege of subscribing to the SCIENCE NEWS LETTER at the reduced price of $3 per year. Application for this privilege should be accompanied by privilege card obtained from the Permanent Secretary, A.A.A.S., Smithsonian Institution Building, Washington, D. C.

In requesting change of address, please give your old address as well as the new one in notification to Circulation Department, SCIENCE NEWS LETTER, 2101 Constitution Ave., Washington, D. C., at least two weeks before change is to become effective.

Publication Office, 1930 Clifton Ave., Baltimore, Md., Editorial and Executive Office, 2101 Constitution Ave., Washington, D. C.

Address all communications to Washington, D. C. Cable address: Scienserve, Washington.

Entered as second class matter October 1, 1926, at the post-office at Baltimore, Md., under the act of March 3, 1879. Established in mimeographed form March 13, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Advertising rates furnished on application.

Member Audit Bureau of Circulations.

DO YOU KNOW?

Several state universities are to offer courses in game management.

The third international congress of Iranian (Persian) art and archaeology will be held in Leningrad in September.

Chinese physicians, mostly trained in America, are replacing foreign doctors in hospitals of Canton, China.

Aztec Indians of Mexico, long before modern psychiatry, considered fear and fatigue as diseases calling for medical treatment.

The first college established by the Spanish in Mexico to educate sons of Indian gentlemen was the College of Santa Cruz, opened in 1535.

Although great ice sheets now exist only in the polar regions, the earth is still in an Ice Age, since some six million square miles are blanketed in ice.

Abyssinia is on a plateau almost as high as that of Tibet.

Surgeon-fish have sharp spines like knives on the sides of their tails.

Tribes in British Africa have been celebrating the Royal Jubilee of Britain's rulers by native dances.

Rubber balloons, used in scientific work, are found to keep their elasticity longer if stored where turpentine is evaporating.

Potato breeders are still working to develop varieties that will not turn black after cooking, and that will resist diseases, heat and drought.

A geologist from Chicago's Museum of Science and Industry has set out for southern Idaho to study the curious lava formations of extinct volcanic craters there.

WITH THE SCIENCES THIS WEEK

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MEDICINE

Cure For Cancer May Be Found In Defensive Diet

Tar Cancer in Mice Influenced by Substances in Diet Which Change the Chemistry of Organic Fluids

THE REAL "cure" of cancer is to be achieved by reestablishing the body's defenses against malignant growth, predict Drs. J. Maisin and Y. Pourbaix, of the Cancer Institute of the University of Louvain.

The means of accomplishing this—suitable diet or possibly chemicals obtained from certain animal organs—are indicated by studies just reported in *The American Journal of Cancer* (June).

For the present cancer patients cannot hope to be cured by diet. They must still rely on surgery, X-rays or radium. The work of the Belgian scientists is still in the experimental stage and their results, promising though they seem, have been obtained only with mice suffering from one form of cancer. The studies are not reported as a cure for cancer but as a signpost for scientists, pointing what seems to be a logical and promising way to an ultimate cure of cancer.

"The experimental results here recorded," the scientists state in conclusion of their scientific report, "may be interpreted as indicating that it is possible to influence the evolution of tar cancer in one direction or the other by diet.

"Our results show unquestionably that chemical factors can be found which protect against cancer or lower the resistance to definite carcinogenic (cancer-producing) substances."

The scientists proceed in the cancer problem on the theory that it is a constitutional disease rather than a local ailment. Consequently they think treatment should be aimed at strengthening the body's defenses, rather than at destroying the cancerous growth. Cancer in their opinion is the "peculiar response of injured cells" of an animal—mouse or man—that has been intoxicated by organic poisons. These poisons may be certain chemicals, as in tar cancers, or they may possibly be poisons produced by the "germs" of chronic infection, or they may be still other poisons that get into the body.

Rebuild the body's natural defenses and the body will be able itself to destroy and dispose of the cancer, they reason.

"By our experiments," they report, "we have demonstrated that in changing by diet the chemical composition of the organic fluids of an intoxicated animal it is fairly easy to modify its cancer response.

"It is reasonable to assume that by further studies it will be possible to find organic chemical compounds which, injected or given in the diet, will protect against the poisoning which leads to a typical growth and cancer.

"We believe, also, that in this way it will be possible to make a cancer slowly disappear, by reestablishing the organic defenses which will take care of the growth.

"Such a cure of cancer seems more logical than a specific remedy with power to kill cancer cells and leave untouched normal cells."

The experiments on which these conclusions are based took many years of work and their report covers many pages in the scientific journal. In summary they are:

Mice develop cancer when their skins are painted with tar. (Men also develop cancer from exposure to tar, as seen in chimney sweeps' cancer and mule spinners' cancer.) When the mice are fed ground up bits of certain organs—liver, pancreas and the lining of the lower digestive tract—the tar cancers develop sooner and grow faster than usual, Drs. Maisin and Pourbaix report. When the mice are fed certain other organs—brain, thymus gland, and bone marrow among others—the tar cancers do not develop as soon as usual. Apparently the latter group of organs contain a substance that checks or stops the growth of the tar cancers.

This is not quite all the story, however. Chemical treatment of the various organs fed to the mice showed that each organ apparently contained one substance that checked the growth of cancer and another that promoted the growth of the cancer. It is through the interaction of these two substances in the various organs or through their proper balance that the healthy body has a system for regulating cell growth, in the opinion of Drs. Maisin and Pourbaix. Cancer is a state of abnormal cell growth.

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BOTANY

Breeding for High and Low Produces Strange Contrast

A STRIKING example of the results which can be obtained by selection in plants is furnished by a corn experiment which has been carried on for over a generation at the University of Illinois. (*Turn to Page* 4)

BREEDING HIGH AND LOW

The tall stalks with their loftily borne ears were bred from seed taken from the same field of corn that produced the dwarf stalks on the right, with ears that hardly clear the ground when ripe.

In the fall of 1902, the late Dr. Cyril G. Hopkins, then head of the agronomy department at the University, went into a field of Leaming corn. He selected the ears growing highest on the stalks and the ears growing lowest, and kept them for seed.

The following spring these ears were planted in separate plots, which were called the low-ear and the high-ear plots. Observations made in the plots that same fall showed that the selection was already yielding results. The ears in the high-ear plots averaged 56.4 inches from the ground and in the low-ear plot the ears averaged 42.8 inches from the ground.

Year after year this work was continued, the highest growing ears being saved from the high-ear plot and the lowest growing ears from the low-ear plot and planted. Six years after the experiment began there was a difference of 34.2 inches in the average height of ears between these plots and an average difference of 34.7 inches in the height of the respective corn plants.

After a quarter-century of this continuous selection, measurements showed the striking differences that had taken place. Strains of corn so unlike in their appearance had been developed that it seemed almost unbelievable they could have had a common origin. The average height of the ears in the low-ear plot was only 8.1 inches, while the ears in the high-ear plot averaged 126.5 inches from the ground.

The studies have also brought out the fact that the low-ear strain became much earlier in maturity than the high-ear strain, and also exceeded the high-ear strain in yields per acre.

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GENERAL SCIENCE

Physician Stops Human Heart And Starts It Again at Will

CENTER of interest in the medical exhibit at the summer meeting of the American Association for the Advancement of Science was a demonstration of the causes and prevention of heart disease, by Dr. M. H. Nathanson of Minneapolis. The physician has found a number of middle-aged people whose hearts he can stop at will, by pressure on a certain nerve in the center of the throat, and then start again with adrenalin and related drugs.

Dr. Nathanson uses this procedure in critical tests of relative values of various heart medicines, as well as for the scientific study of the two principal causes of "heart failure," cardiac standstill and ventricular fibrillation.

Another medical exhibit showed the usefulness of a preparation known as thorium dioxide sol in the more accurate X-ray diagnosis of cancers, tumors and other malignant conditions of the internal organs. This substance shows a tendency to concentrate in such sick tissues, so that they cast denser shadows on photographic plates when X-rays are turned on the suspected body regions.

Ancient Americans

An exhibit attracting much interest was one bearing on the still-vexing riddle of ancient man in America, arranged by Prof. A. E. Jenks of the University of Minnesota. Outstanding in this display was the skeleton of a human being found in that state, associated with stone dart points of the Yuma and Folsom types, closely resembling similar weapons that have been appearing in increasing numbers in apparently quite ancient deposits. Some of them, found in the southwest, have been mixed with the bones of extinct species of bisons. Other flint points of the same type, not associated with human remains, have also been discovered in Minnesota.

Even older than the "Brown's Valley" skeleton found with these dart points is a famous skeleton, known as "Minnesota Man," discovered by Prof. Jenks some time ago. This was on display, together with the implements and ornaments associated with it.

Was prehistoric man in America a hunter of mastodons and mammoths, as ancient European man was?

This question, to which science as yet has no positive answer, is raised by a group of ivory objects collected in the upper Mississippi River Valley displayed by Dr. Jenks.

The collection is not large; two ornamented armbands, much broken; a three-cornered scraper with sawlike teeth on one side accurately carved in imitation of bear's teeth; and a tubular pipe, shaped like half of an enormously thick cigar, constitute the whole of it. Part of the objects were found buried below ground level, under an Indian mound that had nothing in it.

They are all made of genuine elephant ivory. The workmanship is clean-cut and symmetrical, and the ornamentation, though simple, is competently applied. But whether the long-dead hunters slew the beasts and carved their ivory fresh, or whether they merely found it, or dug it up as fossil ivory, as men still do in Alaska and Siberia, there is at present no way of knowing.

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ANTHROPOLOGY

Chinese Conflict Involves Region of Peking Man

ASIATIC man's most ancient home lies in the section of China on which Japan has fixed a determined eye. In this neighborhood some of China's greatest archaeological discoveries have been coming to light.

Bleak limestone cliffs in this region have revealed Peking Man, China's oldest inhabitant and one of the world's earliest cave dwellers. Located within forty miles of Peiping, a cave at Chou Kou Tien has recently become one of the famous and significant places of the earth, for the early history of man.

Since the first discovery that China was inhabited far back in the Old Stone Age, much has been learned about the life and times of Peking Man. Excavations of the cave by the late Dr. Davidson Black, Canadian scientist, and by Chinese scientists have shown that Peking Man hunted horses, deer, elephants and other wild animals of the early part of the Old Stone Age. Peking Man made a variety of stone tools and he knew how to build fires.

If China's earliest inhabitant represented a branch line of the ugly Neandertal race which spread over Europe and the Near East in the middle of the Old Stone Age, some 60,000 years ago, he was a remarkably early appearance of that breed. The cave at Chou Kou Tien has added many new facts to the knowledge of man's early attempts to possess the earth.

Excavations at the cave continue to yield information. A discovery last year showed that the cave was inhabited successively by baboons, Peking Man, and early Modern Man, who lived almost as simply as old Peking Man himself. The series of cave tenants was pronounced a "coincidence" by Dr. Black.

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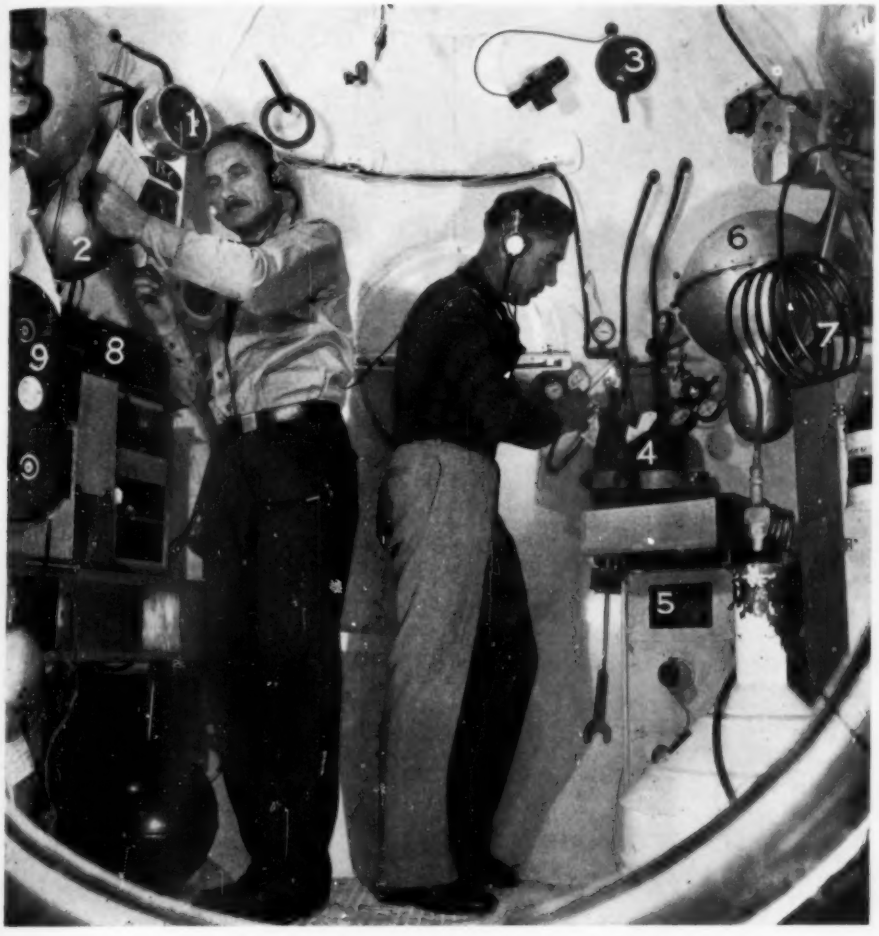

INSIDE THE STRATOSPHERE GONDOLA

Capt. Albert Stevens, left, and Capt. Orvil Anderson testing the compactly-arranged apparatus in the gondola of the National Geographic Society-Army Air Corps balloon Explorer II. Identifying numbers have been placed on the various instruments. They are: 1. Altimeter for measuring altitude. 2. Lead-shielded electroscope for detecting cosmic rays. 3. Electrical firing device for releasing ballast from bags hung outside gondola. 4. Cylinders of compressed gas for operating balloon valves. 5 Cosmic ray instrument. 6. Container for stratosphere air. 7. Part of air-conditioning unit. 8. Battery of factograph cameras for recording readings of 19 instrument dials. 9. Aerial camera for photographing horizon.

ASTRONOMY

Huge Island Universe Found In Cloud of Star Dust

FORTY years after it was first sighted Harvard astronomers have pierced through the intervening "star dust" and taken observations which prove that the obscure stellar object known only by its number—I.C. 342—is really the third largest spiral nebula now known.

I.C. 342 turns out to be a great island universe which covers an area of the sky about as large as the full moon. Because it is almost a million light years away, however, its actual diameter is nearly 10,000 light years.

A light year, remember, is the distance a ray of light would travel in a year at its enormous velocity of 186,000 miles a second. Multiply 186,000 miles by the number of seconds in a year and then by 10,000 years and you have the linear diameter of I.C. 342—roughly 60,000,000,000,000,000 miles.

Reports the Harvard College Observatory in its announcement:

"The belated discovery of the great size of I.C. 342 arises from the fact that it is situated not far from the plane of the Milky Way. Dark obscuring materials, possibly meteoric dust, in the interstellar spaces along the Milky Way have cut down the visibility of the arms. They are seen only faintly, as though partially concealed by smoke clouds. The nucleus, as measured on Harvard plates, is of the twelfth magnitude, visually, and therefore it can be observed in a moderate sized telescope."

These interstellar "smoke clouds" or star dust are the bane of the astronomer's existence. Particularly in the field of measuring the rate of the expansion of the universe is the obscuring interstellar haze bothersome.

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CHEMISTRY

Intense Sound Makes Milk More Easily Digestible

MAKE a loud enough noise at milk and the baby will digest it more easily.

That, in effect, is the discovery reported by Dr. Leslie A. Chambers of the University of Pennsylvania. Dr. Chambers spoke before the American Dairy Science Association, meeting jointly with the American Association for the Advancement of Science.

The apparatus used in the experiments consisted of a heavy steel diaphragm, driven by an oscillating electric current. Similar devices are used for submarine signalling. Over the diaphragm Dr. Chambers flowed a thin stream of milk, while he caused it to vibrate very strongly at various rates. The lowest vibration rate he used was 360 cycles a second, which is the pitch of F-sharp in the middle of the piano keyboard. The highest rate was 3,000 cycles a second, about three octaves higher than middle F-sharp.

The effect was to alter the curd-forming character of the milk. Whereas the milk used normally formed a hard curd, difficult to digest, when acted upon by the pepsin of the stomach, after treatment it formed a soft, easily digested curd. Soft-curded milk is especially desirable for feeding babies, as well as older persons with "weak stomachs." Some cows naturally produce soft-curded milk, but many do not. Dr. Chambers' experiments have demonstrated a simple mechanical method to make soft-curded milk at will, out of any kind of milk.

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A cemetery where warriors were buried about the third or fourth century A.D. has come to light in Hungary.

ARCHAEOLOGY

Writing of Ancient Slave Confirms Old Testament Story

CONFIRMATION of Old Testament history is coming to modern science through the writing of a humble slave.

So archaeologists now realize, as they proceed with translation of Hebrew inscriptions discovered early this year at ruins of the Old Testament fortress of Lachish, in Palestine.

The discovery is proving to be the most important of a century in Palestine archaeology, stated L. Harding, assistant director of the British expedition finding the inscriptions, in an interview with a Science Service representative.

The documents, which are hailed as actual contemporary records of current events, paralleling incidents in the reigns of Bible kings, are written with ink on pottery, in the Hebrew language.

Translation has proceeded far enough to show that a consecutive series of documents is the work of a slave of a keeper of the guard, at the fort outside Lachish.

One of these documents, Mr. Harding stated, criticizes a man named Urijah for undermining the courage of the Jews.

The Old Testament book of Jeremiah cites the tragic story of this prophet Urijah, who prophesied downfall for Jerusalem and the land of Judah, as Jeremiah did, if they pitted their feeble strength to revolt against Babylonia. The slave's writing shows the opposition feeling which was held by some of the people. The date of the document is 597 or 598 B.C.

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GENETICS

Hereditary Defects Crop Out Anew In Each Generation

HEREDITARY diseases and defects, such as hemophilia or "bleeders' trouble," are not always due to defective traits in the inheritance of the sufferer. Hemophilia is sometimes called the "king's disease" because the Spanish and Russian royal families have it as a hereditary factor.

A considerable number of all cases originate in persons with no family history of such defects, simply by mutation, or the tendency for new evolutionary characters to crop out in lines where they previously have not existed.

This conclusion has been reached independently by two English scientists, Dr. L. S. Penrose of the Royal Eastern Counties' Institution at Colchester, and Dr. J. B. S. Haldane of University College, London, who have published their results jointly. (*Nature,* June 1).

Two hereditary defects were studied: hemophilia, or the inability of the blood to clot, resulting in excessive bleeding from trifling wounds; and epiloia, a condition in which tumors of the skin, brain and sometimes of the heart and kidneys, are liable to be associated with epilepsy and mental deficiency. Persons afflicted with either of these disorders naturally have a high mortality rate, and as a rule do not reproduce, at least in severe cases. Yet the number of hemophiliacs and epiloiacs remains distressingly large.

The explanation, in the opinion of Drs. Penrose and Haldane, is that these defects arise by mutation in previously healthy stock. They estimate that in each generation about 25 per cent. of all cases of epiloia are "sporadic and are presumably due to mutation." In the part of England covered by the study, about one person in every 30,000 of population has epiloia. This, the two investigators conclude, "implies a mutation rate of about one in 120,000 per generation."

Similarly, hemophilia, though an hereditary trait, is so disabling that the marriage rate of hemophiliacs is very low, and their reproduction rate presumably even lower. Dr. Haldane estimates that "the frequency of hemophilia in London males certainly exceeds one in 100,000 at birth and may well exceed one in 30,000. A rough estimate of the mutation rate is one in 50,000 to 100,000 per X-chromosome per generation."

This study is considered to be of importance far beyond its immediate medical and sociological interest. Hitherto there has not been even an approximate estimate of how fast the human race "mutates," although data on mutation in other organisms have been obtained. Drs. Penrose and Haldane, as one outcome of their studies, estimate that "man seems to be somewhat more mutable than Drosophila," the tiny insect most used in genetical researches.

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PALEONTOLOGY

Relief Workers Unearth Bones Believed Mastodon's

WORK of uncovering the remains of a prehistoric animal tentatively identified as a mastodon is proceeding rapidly. Two huge jaw-bones, about three feet long and perfectly preserved, have been dug from the bottom of an FERA drainage ditch near Savannah, Ga., and several enormous bones, apparently ribs, have been uncovered.

The legs of the animal are believed to lie in a spoil bank just off the narrow ditch, and work there has just begun. Identification has been tentatively made from one perfect tooth discovered when the relief workers dug the ditch several weeks ago.

After the identification, Lane Mitchell, assistant state geologist, was sent to take charge of the work. The FERA workers, at first, failed to recognize the importance of their find, and many of the bones were crushed with their heavy shovels, and tossed aside.

The bones are extremely brittle, but are approximately in the same form as when the animal died. They have not become fossilized.

The remains were discovered four feet under the surface, resting on a bed of white sand, apparently the bottom of some prehistoric lake. They had been covered with a black clay, which helped preserve them. The upper stratum in this section is another layer of white sand.

The formation is identical with that of the Hainer's Bridge section where mastodon bones were discovered 112 years ago. That spot is a little more than a mile from the present discovery.

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JAW BONES OF A MASTODON?

ASTRONOMY

Costly Grinding of Mirrors For Telescopes Now Avoided

New Process Calls for Depositing Just Enough Aluminum in Right Places to Produce Desired Shape

A NEW discovery promising to revolutionize the whole costly and lengthy procedure of finishing large and accurate mirrors for giant telescopes was announced by Dr. John Strong and Prof. Enrique Gaviola of California Institute of Technology before the meeting of the Pacific Division of the American Association for the Advancement of Science.

Amateur and professional astronomers of the future need not be paragons of patience as were their forebears. Instead of rubbing and grinding a spherical mirror for months or even years until the desired parabolic shape, the new Strong-Gaviola method is to deposit just enough aluminum on the mirror in just the right places to change the sphere to a parabola.

Errors Easily Corrected

The amount to be deposited can be calculated in advance instead of using the tedious cut-and-try methods of grinding of the old opticians.

If something goes wrong, instead of reworking the whole mirror, it is only necessary to remove the aluminum and repeat the process. The method is an outgrowth of Dr. Strong's technique for evaporating aluminum on large glass mirrors in a vacuum to attain better light-gathering power through all of the spectrum. Dr. Gaviola, who is visiting professor from Buenos Aires, has been assisting him in this work.

First a Success

The first attempt to turn a spherical mirror into a parabolic one by evaporation has just been completed with complete success. Drs. Strong and Gaviola used a mirror twelve inches in diameter for the test. There are great technical difficulties in handling very large mirrors, but the limit has not nearly been reached in the present case.

The evaporation technique may change the practice of the design of optical instruments, and astronomers have shown great interest in the method.

Other shapes of telescope mirror surfaces can be made beside parabolas. Hyperbolas, for example, can be constructed. At present mirrors of this shape present enormous constructional difficulties, especially when they are off center, and are avoided at all costs. Yet they have their uses in astronomical research.

To grind the great mirror of the 100-inch telescope at Mt. Wilson Observatory took three men five years, astronomers at the U. S. Naval Observatory report.

The 69-inch mirror of Perkins Observatory telescope at Ohio Wesleyan University required over two years of continuous grinding to bring it to its parabolic surface.

The new 200-inch telescope mirror of the California Institute of Technology will have to be ground from three to five years, according to various estimates, before it is accurately shaped.

Exchange Information

Now that large astronomical mirrors have been coated with aluminum and tried out, a group of astronomers and physicists got together at the meetings of the Pacific Division of the American Association for the Advancement of Science in Los Angeles and compared notes.

Dr. John Strong of the California Institute of Technology, who has aluminized all the big astronomical mirrors so far, told some of the tricks involved. The main thing is to get a good vacuum and a fantastically clean surface for the aluminum to stick to. Then just the right amount of aluminum has to be melted on the right size of tungsten wire and the wire heated until the aluminum has boiled off in all directions.

A Good Alloy

Prof. Hiram Edwards of the University of California at Los Angeles told how he happened to find a most favorable alloy of magnesium and aluminum to deposit by evaporation in a vacuum. He found the reflecting power of the alloy to be remarkably constant and equal, for visible light, to the unheard of value of 94 per cent. This is 4 per cent. higher than aluminum. Astronomers from various observatories pointed out newly found advantages for aluminum. No mirrors have deteriorated so far. They have proved easy to clean of dust and they permitted longer exposures because of the cleanness of the pictures photographed. One mirror on a sun telescope had to be treated with optical rouge every week while it had a silver surface, but during the last year and a half since it was aluminized it required no attention. The full investigation of all the benefits of aluminum will probably not be completed for years.

CHEMISTRY

What Happens Inside a Hot Potato Is Investigated

SCIENTISTS believe they have solved a kitchen mystery—why potatoes grown on dry land cook faster than irrigated potatoes of the same variety.

What happens inside the potatoes while cooking has been investigated by means of a penetrometer, Miss Emma J. Thiessen, of the University of Wyoming, reported to the American Home Economics Association.

Readings of the instrument showed that an irrigated potato when cooked softens throughout at the same general rate of speed. The outer layer of a dry land potato offers greater resistance to sofening, but the potato on the whole cooks faster.

Miss Thiessen examined the cell structure of the two kinds of potatoes and found that the larger the cells, the more readily they soften when cooked. The dry land potatoes have notably large cells.

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GEOLOGY

"Elephant Eldorado" Mined In Southeastern Oklahoma

BONES of extinct elephants of Ice Age times have been removed by the ton from several mounds near Eldorado, Okla., by scientists from the University of Oklahoma and Kansas State College. The place is a veritable fossil mine; it has yielded to date seven skulls and many assorted bones, tusks and teeth of the giant Columbian elephant, one of the largest elephant species that ever lived. The total weight of the material removed is about 7,500 pounds.

The scientists who have been concerned in the development of this great "bone mine" have been Prof. J. Willis Stovall, Prof. C. E. Decker and L. I. Price, of the University of Oklahoma, and Seward E. Horner and Russell R. Ballou. The mounds are on a farm belonging to E. K. Webb.

The mounds had long been known to residents in the region, and amateur digging had been carried on in them for many years. But it was not until Prof. Stovall's attention was called to them by Prof. Decker that systematic scientific exploration began. The project has been supported in part by Federal aid funds.

In addition to the numerous elephant remains, bones of extinct species of camel, horse and bison have been excavated. The bones are all in rather fragile condition, and great care has to be exercised to get the pieces out without further breaking them. The elephants range in age from mature individuals down to young ones from five to seven years old.

Geologic evidence, says Prof. Stovall, indicates that in the days when the elephants ranged the West, this place was a water-hole with a bottom of very soft mud, in which the animals were mired. At present the clays are very hard and tough, breaking out in very irregular blocks.

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CHEMISTRY

All "Appetite Vitamin" In World Shown to Doctors

THE WORLD'S entire supply of synthetic vitamin B_2, amounting to four grams, or about sixty grains, has been shown to members of the American and Canadian Medical Associations at their Atlantic City meeting.

The precious stuff, seen as brownish crystals in a small flask, was prepared by a pharmaceutical supply house under the direction of Prof. P. Karrer, of Zurich, Switzerland, who discovered the chemical formula for the vitamin from which the crystals were made in the laboratory.

Known as the anti-pellagra vitamin and also as the appetite vitamin, the new material, when available commercially, is expected to be a big aid to worried mothers whose children refuse to eat. A small amount of the synthetic vitamin, it is believed, will stimulate the appetite so that there will be no more difficulty with these children at meal times.

Lack of appetite is only one of many symptoms which scientists believe are due to deficiency of this vitamin in the diet. Others are inflammation of the mouth and tongue, intestinal disturbance, discoloration of the skin and certain skin diseases.

Vitamin B_2 is found in the whey of milk, grains, and certain leafy vegetables. It occurs in such small amounts in these foods that a child or adult with a poor appetite would not be apt to eat enough of the vitamin and the further lack of it further lessens his appetite, thus creating what physicians term a vicious circle.

Science News Letter, July 6, 1935

IN SCIE

FISHERIES

Oklahoma Catfish Eat Jackrabbits

CATFISH bite jackrabbits, in Oklahoma.

This is not a result of recent floods in the state's rivers, celebrating a bit too enthusiastically the breaking of the drought. The catfish, which are of the valuable channel cat species, live at a fisheries station, and the jackrabbits are brought to them.

Once a week they get rations of beef liver, and once or twice a week a treat of jackrabbit meat. Employees go out into the brush with shotguns at dusk and easily get enough rabbits for their wide-mouthed charges.

Since Oklahomans like channel catfish, and don't care especially for jackrabbit, the arrangement is satisfactory all around.

Science News Letter, July 6, 1935

CHEMISTRY—MEDICINE

"Colloids" May Aid in Treating Hopeless Cancer

THE possibility that the "colloid" chemist may be able to play a significant part in the fight against cancer was demonstrated by Prof. E. F. Burton of the University of Toronto at the Colloid Symposium held by Cornell University.

Two patients suffering from cancer in a hopeless stage were apparently cured by having injections into their veins of pure metallic arsenic in colloid form, Prof. Burton reported.

The use of this form of arsenic in treating these cancer patients was suggested by a practising physician of Toronto, Dr. A. C. Hendrick. The arsenic "colloid" was prepared by Prof. Burton by mixing arsenic with water and using some gelatin as a binder to keep the arsenic from precipitating out of the solution. The resulting mixture, in which the tiny particles of arsenic are held suspended in the liquid, even though they will not dissolve in it, is known as a colloid.

Science News Letter, July 6, 1935

FIELDS

ENTOMOLOGY

Flashing Fireflies Form "Constellations"

FIREFLIES that flash simultaneously in large numbers do not always behave alike. They vary according to species, claims Gerrit S. Miller, Jr., of the U. S. National Museum, commenting (*Science, June* 14) on an explanation offered by John Bonner Buck, of the Johns Hopkins University, for the simultaneous flashing of fireflies over a whole meadow or lawn.

Mr. Miller presents observations made by himself in Jamaica. Here a different firefly species flashes in large groups or "constellations," but these "constellations," though within sight of each other, do not adopt the same flash-rhythm, as observed by Mr. Buck. Instead, each group is a law unto itself for a time. Then a disintegration of the rhythm sets in, and the flashes come wholly at random.

Science News Letter, July 6, 1935

PSYCHOLOGY

U. S. Children Excel In Scientific Thinking

THE CHILDREN of the United States possess a level of scientific thinking superior to that of the young of other countries.

That the scientific tradition in this country has made the thinking of children more logical is the conclusion of Miss Jean L. Marquis, of the Institute of Child Welfare, University of Minnesota, expressed before the American Association for the Advancement of Science.

In Miss Marquis's experiment, 700 children were asked such questions as "What makes the wind blow?" "What causes thunder?" "How is it that airplanes can stay up in the air?"

Investigators in other countries have found that young children think of such matters as governed by some spirit or force. They do not make any attempt at a scientific explanation. Yet Miss Marquis found that even among the 8-year-olds she questioned, only a small percentage, 13 per cent., gave such "prelogical" replies. All the others implied a material or naturalistic cause for these phenomena.

The schooling and experience of the child have a lot to do with his outgrowing his babyish, unscientific way of thinking. The adequacy of the children's answers were found to be more closely related to school grade than to intelligence. They improve steadily with age, and are better for the boys than for the girls.

The child does not seem to attain a certain level of reasoning as a result of his maturity and intelligence alone, Miss Marquis concludes. He explains each phenomenon in the light of his experience and training with his intelligence and age acting as limiting factors.

Show the young child of your acquaintance that a candle is extinguished when you put a glass jar over it, and ask him why. You may be surprised at the excellence of his answer.

Science News Letter, July 6, 1935

GENERAL SCIENCE

Dr. Irving Langmuir Elected to Royal Society

DR. Irving Langmuir, American Nobelist in chemistry and scientist of the General Electric Company at Schenectady, N. Y., has been elected to foreign membership in the Royal Society.

Foreign membership in the Royal Society is one of the highest honors scientists of the British Empire can bestow on an alien scientist. Foreign members are limited to fifty, throughout the world. The Royal Society received its charter from the King in 1662 and is one of the oldest scientific organizations in the world.

Only seven other Americans besides Dr. Langmuir are listed as foreign members of the Royal Society. They are: Dr. W. W. Campbell, astronomer, Lick Observatory, Hamilton, Calif.; Dr. Simon Flexner, Rockefeller Institute for Medical Research, New York City; Dr. George E. Hale, astronomer, Mt. Wilson Observatory, Pasadena, Calif.; Dr. Thomas Hunt Morgan, geneticist, California Institute of Technology, Nobel Prize winner in medicine and physiology; Dr. Robert W. Wood, physicist, The Johns Hopkins University, Baltimore, Md.; Dr. Henry Fairfield Osborn, paleontologist, American Museum of Natural History, New York City; and Prof. Edmund B. Wilson, biologist, Columbia University, New York City.

Science News Letter, July 6, 1935

ANTHROPOLOGY

Bones Tell of Cannibalism In Ancient Minnesota

CANNIBALISM of a unique form, practised by Indians in Minnesota long ago, has been detected by archaeological investigation. A burial mound at Laurel, Minnesota, revealed this new type of cannibalism. Lloyd A. Wilford, anthropologist, reported the discovery, which was made by a University of Minnesota expedition.

From damage done to many leg and arm bones and skulls, in these burials, Mr. Wilford concludes that the long bones were deliberately crushed near the end to allow the marrow to drain out, and skulls had the lower part of the occiput removed so that the brain could be extracted. Both children and adults were so treated. The bones, which the anthropologist believes to have been stripped of their flesh for cannibalistic purposes, were thus broken to yield additional material before being packed into bundles and buried.

"The purpose of such crushing and breaking," said Mr. Wilford, "was no doubt to secure the marrow fat and the brain for food or for industries such as tanning.

"It is well known that the Indians used animal brains in their skin-dressing operations, and animal grease such as marrow was always welcome for industrial purposes."

Science News Letter, July 6, 1935

AGRICULTURE

"Farm Chemurgic Council" Formed Following Meeting

A "FARM Chemurgic Council," designed to promote the use of farm products in industry, has been formed in Chicago following the recent meeting of the Conference of Agriculture, Industry and Science at Dearborn, Mich. Francis P. Garvan, president of the Chemical Foundation, Inc., was elected president of the new organization.

Among the projects to be fostered by the Farm Chemurgic Council are the use of soy bean oil in the paint industry, to replace imported drying oils, and the blending with gasoline of alcohol made from surplus grain and other farm products. It is the hope of the Council that by such means idle acres can be put back into production, supplying American industry with substitutes for raw materials now obtained from abroad.

Science News Letter, July 6, 1935

PHYSIOLOGY

"Brainstorm" Becomes Scientific

Brain Waves, Too, Desert the Realm of Slang to Join Physicians' Vocabulary as New Tool of Research

By JANE STAFFORD

NOTE: The recording and interpretation of the electric impulses from the brain have recently become a fertile field of research. This article, with that in SNL, June 22, p. 397, will give you a compact summary of the major programs now being conducted along this line.

BRAINSTORMS and brain waves have been taken out of the realm of slang and become scientific records. Scientists have found a way to tap the electrical impulses generated by brain activity and to study their messages which come off as wavy lines on strips of paper. They are translating these into terms of illness and health, thought, rest and unconsciousness.

This does not mean that the scientists, at Brown and Harvard Universities here and in England and Germany, can, strictly speaking, "read your mind" with their new electrical hook-up. They cannot tell from the brain messages what you are thinking. But they can tell whether you are "sitting and thinking" or "just sitting." They can tell, without having seen you while the messages were being transcribed, whether you were awake or asleep, in a faint, suffocating, under an anesthetic, or a sufferer from that mysterious malady, epilepsy.

In fact, the first fresh lead to a solution of the age-old problem of epilepsy which scientists have found in a long time is furnished by the electrical apparatus which has been popularly but mistakenly christened a mind-reading apparatus.

Neurological Storm

Discovery that epilepsy is probably a neurological storm—a brainstorm plus a storm in the rest of the nervous system—is but one of the achievements made in this new field of investigation. Important information about the effect of anesthetics on the brain is being gained and it is hoped that this information will enable the surgeon to be much more skilful and precise than he now can be in choosing the kind and amount of anesthetic he uses to put a patient to sleep before an operation. Other facts which scientists hope to learn from the brain messages received over the electrical hook-up relate to the differences in mental processes between men and apes and between men themselves.

Scientists call these brain messages obtained by electrical methods electroencephalograms. This long word is not hard to pronounce if you split it into its natural parts: electro-en-cephalo (referring to brain)-gram. They are akin to the now familiar electrocardiograms, the telegrams from the heart which modern physicians use to diagnose certain types of heart ailment.

Century Old Idea

Although the electroencephalograms are creating quite a furore in scientific and lay circles as something very new as well as promising, they have their beginnings in discoveries made nearly a century ago. Medical knowledge of the electrical properties of living tissues dates from the researches of Prof. Emil du Bois-Reymond, beginning in 1843. It is the electrical properties of living tissues that enable modern scientists, using the technical advances of modern electrical and radio engineers, to study the action of heart, muscle, nerves, and now the brain itself. The idea of measuring and figuring the variations of action currents from the living heart by leading them off through "electrodes" placed on the moist skin and connected with that important electrical instrument, the galvanometer, first occurred to Augustus D. Waller in 1889. His method was improved on, made accurate and the name "electrocardiogram" coined by Willem Einthoven of Leyden in 1902.

Using radio apparatus, Prof. E. D. Adrian of Cambridge University was able to detect the electric current passing along a single nerve fiber. For this achievement, he shared in the Nobel Prize for 1932 in medicine and physiology.

The German scientist, Dr. Hans Berger of Jena, found that the changes in electrical potential connected with human brain activity may be magnified by running them through a vacuum-tube amplifying system similar to that used in radios and then the enhanced current used to operate an oscillograph which writes in light on a photograph a wavy line corresponding to the fluctuations of the electricity in the brain.

Dr. Berger's work has been confirmed and amplified by Prof. Adrian in England, by Drs. H. H. Jasper and L. Carmichael of Brown University, and by Drs. A. J. Derbyshire, F. A. Gibbs, H. Davis and E. L. Garceau of Harvard University. It was Drs. Gibbs, Davis and Garceau who used the new technic to investigate epilepsy, while Dr. Derbyshire, with Drs. A. Forbes, B. Remple and E. Lambert, also of Harvard, has been investigating the effects of various anesthetics on the brain and central nervous system.

Having an electroencephalogram made of your mental processes is about as simple and painless as having your picture taken. At a recent demonstration to scientists in Detroit, a number of men volunteered to be "human guinea pigs" and, apart from some embarrassment at being part of the show, seemed to enjoy the experience. They sat in a comfortable chair with their eyes closed and did mental arithmetic problems given by Dr. Gibbs, or answered questions or "just sat" and did and thought nothing, while the interested scientists gathered around the machine where the brain waves were appearing on paper. One of the subjects, not sure that he had given the correct answer to the multiplication problem given him, did it over again in his mind, saying nothing to the doctors. Much to his astonishment, Dr. Gibbs afterward showed him on the transcription of his brain waves the place where he first did the multiplication, the place where he rested, the place where he did his own private checking of his multiplication, and where he again rested, satisfied that his answer had been correct.

Making It Painless

When Dr. Berger first started making electroencephalograms, he thought it was necessary to penetrate within the head to obtain the brain current records and so he inserted needle electrodes through the patient's skin. The Harvard scientists insert one tiny needle electrode in the lobe of the ear and the other in the scalp, using a local anesthetic first so that there is no pain when the needles

are inserted. The Brown scientists, however, fasten pieces of metal next to the skin on the patient's head and these pieces, acting as electrodes, pick up the brain currents without any sensation on the part of the patient.

Waves Magnified

The electrodes pick up the brain waves and send them through a vacuum tube amplifying set similar to those used in radios. This magnifies the brain waves so that the enhanced current can operate an oscillograph which writes in light on a photograph a wavy line corresponding to the fluctuations of the electricity in the brain. The fluctuations which appear on the photograph, or on a piece of paper something like ticker tape, represent the state of activity or changes in that state within the brain.

The size, shape and frequency of the waves all are thought to be significant. Scientists are not yet able to decode all the symbols in these messages from the brain and so they state that exact interpretations of the electroencephalograms cannot yet be made. They have already decoded enough of the symbols, however, to draw some interesting conclusions and to feel that the electroencephalograms will "prove significant in psychology and clinical neurology" as well as tell much about the brain's activity in mental and nervous diseases.

Two kinds of brain waves were detected by Dr. Berger. The biggest waves he called alpha waves, giving to the smaller ones the name of beta waves. The alpha waves, Dr. Berger found, became smaller when the patient was under certain types of anesthetic, during an epileptic seizure, and when the person being studied did a "mental" problem or had his senses stimulated. The waves are the largest when the person is relaxed.

Alpha and beta waves were also detected by Drs. Jasper and Carmichael. In addition they found another type of wave which appeared when the subject's senses were stimulated by light or sound. Further experiments may show that waves of this type are irritation or stimulation waves.

Slow in Illness

The frequency of the alpha waves does not vary much from day to day in the same person, the Brown University investigators reported. In one or two cases of illness, the frequency of these waves was very low.

Some normal persons and especially sick persons show different frequencies or lack of synchronism between the functioning of one side of the brain and that of the other. One girl, who was subject to "fits" or convulsions and who was quite ambidextrous, had an alpha-wave frequency of ten per second on the left side of her head and of but six to eight across the right side of her head.

Extremely interesting is the information Drs. Davis, Gibbs and associates of Harvard have gained from electroencephalograms of epileptic persons. Epilepsy, a malady characterized by sudden loss of consciousness and fits, today afflicts almost as many persons in the United States as tuberculosis. In spite of much research, physicians are still almost as baffled by it as were the old Roman doctors who tried to cure Julius Caesar of the seizures he suffered which are said to have been epilepsy.

Epilepsy, the Harvard scientists find from study of electroencephalograms, is probably a nerve and brain storm—neurological storm, they call it—which results in great piling up of electrical discharges. Even between seizures, something is wrong with the brain and nervous system, the brain messages show. Normally the small waves come off from the brain at the rate of about ten per second. When a person is sleeping, in a faint, or loses consciousness temporarily in the strange sleep disease called narcolepsy, the brain waves are slowed down to about three to five per second and have about double the normal voltage.

In minor epilepsy, just before and during an attack, the brain waves come off at the rate of about three per second and in a strange pattern of large round waves with a spiky wave between the round ones. In major epilepsy both fast and slow waves of much greater than normal voltage are found.

Hopes For Future

These changes probably hold the clue to what is going on in the brain at the time of a seizure, and if they find just what the waves mean in terms of nervous activity, the Harvard scientists believe they may be able to find out what an epileptic seizure is and how it starts. If they find that in some cases it starts in a part of the brain which the surgeon can get at, there might be a chance that the part where the disorder starts could be removed. This prospect is far in the future, however, Dr. Gibbs emphasized.

Definite and characteristic changes appear in these patterns of brain activity when different kinds and different amounts of anesthetics are used, the Harvard scientists also found. The patterns are not the same when an animal is under ether, for example, as they are when he has been given avertin. Changes in the pattern of the brain waves also

NOT FOR MIND READING

But with this apparatus, being tested by Dr. H. H. Jasper of Brown University, the electric impulses from the brain can be observed or photographed.

occur when the animal's sensory nerves are stimulated, and from this observation the scientists hope to find how the brain activity is linked with the world outside, for example, what happens in the brain when you feel a touch on your arm. A difference between the electric messages picked up from the brain and those of nerves was found by the British scientist, Dr. Adrian.

The electrical disturbance which travels as an impulse along a nerve fiber spreads along the fiber as a momentary wave—a brief impulse followed by a brief interval of rest and recovery. In the cerebral cortex, the gray matter of the brain, on the other hand, instead of the abrupt spikes observed in a record from an active nerve fiber, there are more gradual large electric oscillations which form a series of waves of smooth contour. These are the brain waves.

The information being obtained about the brain and nerves by electrical means is expected to revolutionize our whole knowledge of the way the human mechanism works, in the opinion of some scientists. Commenting on these advances, Prof. C. Judson Herrick, of the University of Chicago, recently said: "I venture the prediction that the electrobiological era now beginning will yield as revolutionary changes in our conceptions of the physiology of the nervous system as the invention of the microscope inaugurated in anatomy."

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GEOLOGY

Earth Is Between 1850 And 3500 Million Years Old

HOW OLD is the earth? Write it down in the family album that its age is between 1850 and 3500 million years. This is the verdict of scientists speaking at the symposium in Los Angeles on "The Geologic and the Cosmic Age Scales."

The meeting, sponsored jointly by the American Physical Society and the Astronomical Society of the Pacific and held at the University of California at Los Angeles, disclosed the different ways science dates the approximate "birthday of the earth" over a thousand million years ago.

One technique is called the "hour glass" method since it is based on the amount and rate of sedimentation laid down by erosion over millions of years. It is comparable to measuring time by using the flow of sand through an hour glass. The difficulty is that no one can be sure that the rate of sedimentation was anywhere near constant through the long periods of time involved, said Dr. George D. Louderback of the University of California.

Much more accurate is the radioactive "time clock" method described by Dr. Robley Evans of Massachusetts Institute of Technology. Certain rocks of the earth contain the elements thorium and uranium, which continually disintegrate and finally form lead. The rate of doing this is unchanged by any natural phenomena yet found by science. Thus, the ratio of the lead to the thorium or uranium present shows how old the rock is.

Still more accurate is to measure the amount of the gas helium present in the sample. This gas is formed as the radioactive elements break down and shoot off alpha particles which are really the cores of helium atoms.

Finally, the impact of the alpha particles on the surrounding material forms, over long periods of time, very small haloes or rings. Some specimens of mica show these rings very well. The age of the sample can be determined by studying the size and fineness of these haloes.

All these methods, as well as others based on astronomical considerations, point to the earth's age—between 1,850,000,000 and 3,500,000,000 years.

Science News Letter, July 6, 1935

ASTRONOMY

African Astronomer Discovers New Comet

A NEW object in the heavens has been reported to astronomers throughout the world by the International Astronomical Union bureau.

The object is a comet and was discovered by Dr. Cyril Jackson of the Union Observatory, Johannesburg, South Africa.

Of the thirteenth order ot astronomical brightness when found (June 19), the object was much too faint to be seen with the naked eye. It appeared low in the southeast sky just north of the bright star Antares, in the constellation of Scorpius. The astronomical coordinates were right ascension, sixteen hours, forty-four and three-tenths minutes; declination, minus nineteen degrees and forty-eight minutes.

The new comet was later sighted (June 24) by astronomers at Harvard College Observatory, Dr. Harlow Shapley reports.

Dr. Fred L. Whipple and Dr. L. E. Cunningham of the Observatory staff find that the brightness of the newest comet is diminishing. On June 24 it had dwindled to the fifteenth order.

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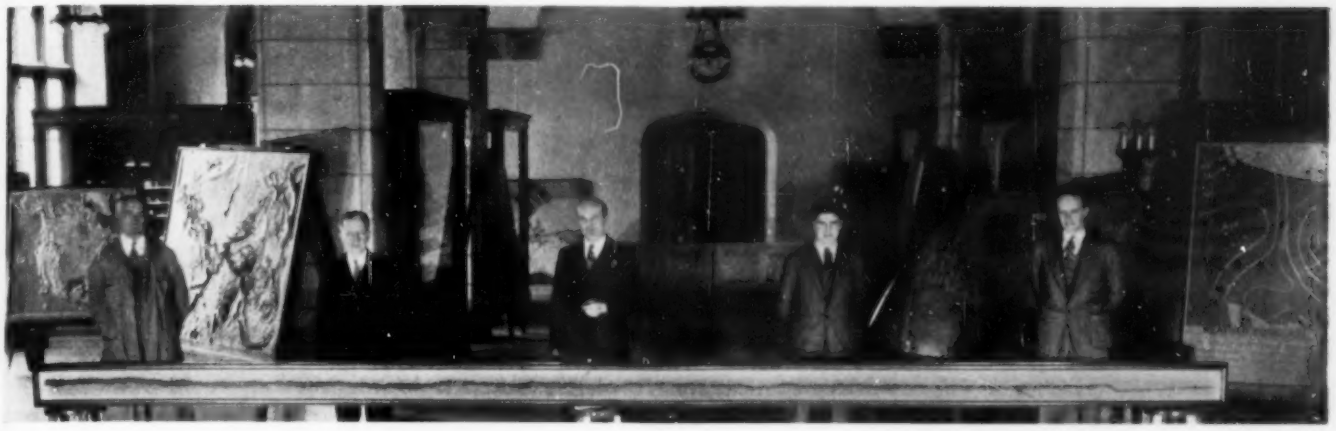
A CLOSE-UP

Showing the appearance of a section of the huge fulgurite shown on the facing page.



MADE BY LIGHTNING

This fulgurite, 23 feet long, was formed when a stroke of lightning hit a sand dune in the Lake Michigan dune area. It is a hollow tube of rough glass.

AVIATION

Daily Seaplane Service To Europe Forecast by Sikorsky

DAILY transatlantic trips, by seaplanes triple the size of today's largest, are forecast for "the immediate future" by Igor I. Sikorsky, noted aircraft designer.

Speaking before the meeting of the Society of Automotive Engineers, Mr. Sikorsky backed his prediction by citing the extremely rapid progress in seaplane design.

Here is the comparison between the Sikorsky "S-40," which set payload seaplane records in 1931, and the "S-42," now about to go into regular commercial service between Hawaii and California:

	S-40	S-42
Weight	21,000 lbs.	19,764 lbs.
Gross weight	34,000 lbs.	38,000 lbs.
Equipment ...	1,000 lbs.	2,181 lbs.
Pay load	3,200 lbs.	8,363 lbs.
Cruising speed	115 m.p.h.	157 m.p.h.
Top speed....	137 m.p.h.	182 m.p.h.

The important part of the development, Mr. Sikorsky pointed out, is the increase of 5,163 pounds in pay load. Or, said another way, if equal pay loads are considered, that is, 7,500 pounds, the range of the S-40 is 479 miles while the range of the S-42 is 1,130 miles, an increase of 651 miles.

Even more striking for economical commercial flight is a comparison by what the aircraft engineers call the ton mile. If an airplane can lift a one-ton payload and cruise with it at 100 miles an hour for one hour, it is credited with a rating of 100 ton-miles.

The Sikorsky S-40, on this basis, every flying hour receives credit for (1.65 tons x 115 miles) 189.75 ton-miles. The S-42 however, receives credit for (4.25 tons x 145 miles) 616.25 ton-miles.

On this comparison the new S-42 is over three times as efficient.

Discussing how the future of transatlantic flying lies in the use of larger seaplanes, Mr. Sikorsky said:

"Several conditions point to the usefulness of increased size of future flying boats as compared with land transports. In the latter case, the great frequency of departure is of value because of the relatively short distance to be covered, and it has been generally found that small ships can be used successfully. In the case of North Atlantic trans-oceanic flying boats, the frequency of departure is of less importance, as a tremendous saving in time is made, reducing perhaps the time involved from four or five days to 24 hours per trip. Needless to say, daily departures will be made.

"Eight professional men will be required for such 24-hour flights, not counting the stewards. Furthermore, the improved efficiency and seaworthiness with respect to the increased size of flying boats are indicative of the possibilities offered. Therefore it is probable that in the immediate future we will see flying boats of up to 100,000 pounds; and in a decade or so flying boats of several hundred tons will probably make their appearance."

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GEOLOGY

23-Foot "Lightning Stone" Displayed at Chicago

A "LIGHTNING stone," or fulgurite, 23 feet long, has been placed on display in the geology museum of the University of Chicago. It consists of a hollow tube of rough glass, formed when a stroke of lightning hit a sand dune in the famous Lake Michigan dune area, fusing the sand momentarily into liquid which immediately hardened again into its present form.

Subsequently the wind blew the sand away, and the exposed slender tube of natural glass broke off piece by piece. The fragments were found a year ago by Prof. George S. Monk of the University physics department. The fifty or more pieces, from two to twelve inches in length, were all found in a limited area, about fifteen by thirty feet, in a pocket in the "blow-out" side of the dune.

Fitting the fragments together was a laborious task, but by persistence Assistant Curator Paul C. Miller finally got them all assembled and mounted for permanent display. Although longer fulgurites have been reported, the Chicago specimen is believed to be the longest and most complete specimen accessible to the general public.

The inside of the tube is smooth glass, but the outside is corrugated, with ridges running lengthwise, with a generally clinker-like appearance.

Science News Letter, July 6, 1935

Strawberries rank as an "excellent" source of Vitamin C.

MEDICINE

Fever Treatment May Prevent Common Form of Blindness

ARTIFICIAL fever treatment is proving a new weapon in the war on blindness and is expected to be a means of preventing one of the commonest forms of this affliction.

Patients whose vision was restored by this treatment combined with drugs were reported by Drs. Arthur M. Culler and Walter M. Simpson of Miami Valley Hospital, Dayton, Ohio, at the meeting of the American and Canadian Medical Associations.

The patients had become blind because of syphilitic infection. This disease causes from 10 to 15 per cent. of all blindness, Dr. Culler said.

In some cases improvement began after one or two treatments and the patients recovered useful vision. In cases in which atrophy or other permanent damage had occurred, the fever treatment did not appear to help any more than other forms of treatment. As most of the fifty-eight patients had failed to respond to other forms of treatment the results were considered satisfactory.

Importance of beginning fever treatment in the early stages of syphilis in order to prevent blindness was emphasized by Dr. Culler. The artificial fever treatment has already been found useful in the mental disease which results from syphilitic infection, it was pointed out.

The patients in the series reported were given ten treatments of five hours each with temperatures above 105 degrees Fahrenheit. Skill in the use of artificial fever has progressed to the point where most patients do not need to remain in the hospital. When the five-hour period of fever is over, streams of cool air bring the temperature down within 30 to 40 minutes. By using new air-conditioned fever cabinets, temperature and humidity are so controlled that no serious effects are suffered.

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CLIMATOLOGY

Upturn from Drought Indicated by 35-Year Cycle

DROUGHT in the West is really licked, we are entitled to hope. The upturn to moister and more comfortable summers has come, if weather events of the past can be taken as any index to what we may expect of the future.

Recent studies of the Brückner cycle, in which about 35 years elapse from drought to drought, show that the last great disastrous dry period in the West ended with the nineties, just 35 years ago. And the last great drought before that was in the sixties, another 35-year interval.

The possible significance of the Brückner cycle was discussed at the meeting of the American Association for the Advancement of Science, by Eric R. Miller, meteorologist in charge of the U. S. Weather Bureau station at Madison, Wis.

The first person to mention a 35-year climatic cycle in print was Sir Francis Bacon, that versatile Elizabethan Englishman who was politician, essayist, lawyer and dilettante scientist. He referred to this phenomenon in his essay "On the Vicissitudes of Things."

Three centuries later, a studious German, Eduard Brückner, made a really scientific study of the matter, taking into account such apparently unrelated things as lake levels, dates of the melting of river ice, vintage times, as well as the direct weather records. Brückner's investigations brought the data down to the middle of the ninetenth century.

Mr. Miller has taken up the study where Brückner stopped, and carries the cycle study through to 1935, using principally data of American meteorological observatories. Although his results are not as clear-cut as he would like to see them, due largely to the short time covered by really reliable weather records in this country, they suffice at least as an indication of weather trends.

So far as his data go, said Mr. Miller, they show that droughts in the past have ended suddenly, with a sharp upturn toward cooler, rainier periods. The patterns shown by the low-rainfall curves of the sixties and the nineties have been followed closely so far this year, with a clean-cut upturn from the curve of the great drought of the thirties.

Science News Letter, July 6, 1935

SEISMOLOGY

Strong Earthquake Reported Off Australian Coast

A STRONG ocean bottom earthquake occurred June 24 near the French-owned island of New Caledonia, off the coast of eastern Australia.

The epicenter is located at 23 degrees south latitude and 165 degrees east longitude and was calculated by the U. S. Coast and Geodetic Survey scientists from telegraphic data collected by Science Service.

This would place the shock center almost on the Tropic of Capricorn, about 800 miles directly east from the Australia coast, and about 900 miles northwest from the tip of New Zealand. The time of the shock was fixed at six hours and 22.2 minutes eastern standard time on June 24.

Seismological stations reporting to Science Service include: Canisius College, Buffalo, N. Y.; Georgetown University, Washington, D. C.; Seismological Observatory, Pasadena, Calif.; St. Louis University, St. Louis, Mo.; and the stations of the U. S. Coast and Geodetic Survey at Tucson, Ariz., Ukiah, Calif., Chicago, Honolulu and Manila.

Science News Letter, July 6, 1935

GEOLOGY

Phantom Ship Will Welcome Many Park Visitors

See Front Cover

RESTING at anchor on a sapphire sea, the Phantom Ship is a natural formation of beauty that will draw visitors from many miles away to Crater Lake in Oregon this summer.

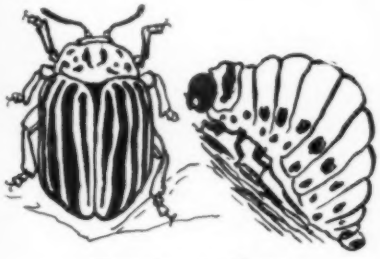
The rocky formation gains its name from the conditions which make it difficult to see it in certain lights when its lava heights blend with the nearby crater walls. The photograph on the cover of this week's SCIENCE NEWS LETTER was taken by Charles H. Simson, of Ft. Klamath, Oregon.

Science News Letter, July 6, 1935

ENTOMOLOGY

NATURE RAMBLINGS

by Frank Thone



Catering to Pests

WITH how much labor has man provided for the insect pests whose depredations are the subjects of his loudest complaints!

Pests that have slipped into this country as unwanted immigrants have received so much attention that we are prone to think of all harmful insects as foreigners. However, this is not the case; some of our worst pests are native species that only awaited the coming of cultivation to provide them with easy livings on a scale to which they had never before been accustomed.

There is the common potato-bug, for example — incidentally, it is really a beetle and not a bug. It apparently originated on the Mexican plateau. Until a couple of generations ago, it was a rather commonplace sort of insect, feeding on the leaves of some of the wild relatives of the potato-tomato-tobacco family. It was not even especially numerous.

Then the white potato, transplanted from South America to Europe, and thence re-introduced into the northern part of the New World, began to be cultivated on a large scale in Colorado, which was within the fringe of the striped beetle's range. Here was an abundance of a new and excellent food, brought to the insect's own feeding ground; and the potato beetle did not hesitate to take advantage of it. In a few years the insect, now dignified with the really unfair designation of Colorado potato beetle, was all over North America, and its possible advent in Europe watched for with dread by agriculturists and entomologists there.

Or again, there is the chinch bug, during the past few years at a destructive maximum in the great central grain-raising area. Like the potato beetle, the chinch bug has lived a rather inocuous and inconspicuous life as a feeder on wild grasses. Its principal home was in the southern Plains region, though specimens were first reported by early entomologists as far east as the Ohio valley.

Then came the conquest of the Prairies and the Plains, and the large-scale introduction of grain farming, with wheat, oats and other small-grain crops from Europe and corn from the eastern United States. At once, the chinch bug began to figure as a major crop menace, adopting an entirely new life cycle.

Science News Letter, July 6, 1935

GENETICS

Heredity May be Responsible For Much Sinus Trouble

THE unfortunate child who suffers from sinus disease may have to blame it on his ancestors, it appears from a study by Dr. Hector Mortimer of McGill University, Montreal.

An underlying factor in certain cases of sinus disease was traced to the pituitary gland in studies reported by Dr. Mortimer. This tiny gland buried in the center of the head plays the role of nature's sculptor in moulding the shape of the face and skull, the Canadian scientist found. The size and shape of the sinuses therefore depend on pituitary function, and they are inherited in accordance with the Mendelian laws of heredity, Dr. Mortimer has discovered.

But inheritance is not the only factor determining the size of the sinuses. Pituitary function may become disturbed after birth so that a child born with a pre-disposition to normal-sized sinuses may fail to develop them because his pituitary gland was not sufficiently active while he was growing up. On the other hand, his sinuses may become too large because of over-activity of the gland, and this may give such a form to the sinuses that if they become subsequently infected drainage may be more difficult than normal.

Poisonous substances and diseases occurring during the growing-up period may also interfere with normal growth of the head bones and consequently with sinus development as well as with growth and development elsewhere in the body, Dr. Mortimer pointed out. Diet, environment and natural selection acting through the pituitary are three factors, which Dr. Mortimer said, affect the bone growth and sinus development.

Science News Letter, July 6, 1935

AGRICULTURE

Selenium in Soil Delayed In Its Action on Livestock

LIVESTOCK poisoned by selenium, toxic chemical element in some Western soils that is taken up by plants and thus eaten by the animals, do not always show the injurious effects at once, Prof. O. A. Beath of the University of Wyoming reports (*Science*, June 21). Sometimes the action of the poison is delayed for many months; then the cattle and sheep suddenly and for no apparent reason "go off their feed" and become seriously sick. A selenium-poisoned animal may escape death, but it seldom recovers full health.

Science News Letter, July 6, 1935

First Glances at New Books

Agriculture—Chemistry

PROCEEDINGS OF THE DEARBORN CONFERENCE OF AGRICULTURE, INDUSTRY AND SCIENCE, Dearborn, Mich, May 7 and 8, 1935—*Chemical Foundation,* 256 p., free. Please enclose 10c. for handling if requested through Science Service. Manufacturers, scientists, farmers and public men discussed at this conference how to utilize chemically more of the agricultural products of the nation. This volume makes the addresses and actions of the meeting available to those who could not attend. Some of the achievements and possibilities discussed included: Cellulose and newsprint from Southern pine, tung oil, power alcohol, the Jerusalem artichoke, etc. Leaders in industry and public opinion presented plans for fitting our industrial and economic life into the scientific facts and possibilities. Under the chairmanship of Francis P. Garvan, president of the Chemical Foundation, a national council will carry further this pioneering effort.

Science News Letter, July 6, 1935

Medicine

BEE VENOM THERAPY — Bodog F. Beck—*D. Appleton-Century,* 250 p., $5. Dr. Beck has adapted the old method of treating arthritis by bee sting to modern medical practice. In this book he gives his views and experiences with the method. The book is designed for reading by physicians rather than by patients.

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Agriculture

AGRICULTURAL ADJUSTMENT IN 1934—U. S. Dept. of Agriculture — *Govt. Print. Off.,* 456 p., 25c. The AAA here gives an accounting of its stewardship during its first full calendar year of operation. The report goes into considerable detail, and presents many statistical tables and graphs; it also discusses plans and expectations for the future.

Science News Letter, July 6, 1935

Zoology

LECONS DE ZOOLOGIE — ANNÉLIDES M. Prenant—*Hermann et Cie, Paris,* 95 p., 16 fr.

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Archaeology

THE MAGDALENIAN SKELETON FROM CAP-BLANC IN THE FIELD MUSEUM OF NATURAL HISTORY—Gerhardt von Bonin—*University of Illinois,* 76 p., $1. A detailed study of the only human skeleton of Europe's Old Stone Age ever acquired by an American scientific institution. The bones are those of a young woman, about 20 years old. The measurements, taken with care to be as exact as possible, are given in 21 tables, and there are nine plates showing parts of the skeleton.

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Medicine

MODERN MOTHERHOOD—Claude Edwin Heaton—*Farrar & Rinehart,* 293 p., $2. How modern medical science can increase the safety and comfort of motherhood and what the expectant parents can do to cooperate is explained in this book. Reading it should increase the expectant mother's peace of mind because it tells her what to expect and why. The information in this sound, sane book will be much more valuable to her than all the advice of well-meaning friends and relatives.

Science News Letter, July 6, 1935

History

THE WRITING OF HISTORY—Louis O'Brien—*Univ. of California Press,* 96 p., $1.25. For the guidance of budding historians, this series of lectures on the technique of historical work is presented. It is intended as a text to accompany oral instructions. It is an English adaptation of Paul Harsin's "Comment on écrit l'histoire."

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Education

HOW TO READ RAPIDLY AND WELL—C. Gilbert Wrenn and Luella Cole—*Stanford University Press,* 15 p., 15c. A little bulletin that should be useful to the general reader as well as to the student. It comes perforated for insertion in a loose-leaf binder.

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Anthropology

THE RACES OF MAN, DIFFERENTIATION AND DISPERSAL OF MAN—Robert Bennett Bean—*University Society,* 134 p., $1 cloth, 65c paper. This corrects price of paper-bound edition, as listed in SCIENCE NEWS LETTER of June 15.

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Art

COLOR DIMENSIONS—Faber Birren—*The Crimson Press,* 57 p., $2. Presenting "a new and revolutionary art of color," the author offers an equation which can be used to work out color harmonies. His approach to the color problem is that of the psychologist dealing in sensation, rather than the physicist's concern with wave lengths of light. To make clear his own theories and a need for the system he has devised, Mr. Birren brings in much background information on the art and science of color.

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Chemistry

CHEMISTRY AND TECHNOLOGY OF WINES AND LIQUORS—K. M. Herstein and T. C. Gregory—*Van Nostrand,* 372 p., $5.50. A book that would have been a bootleggers' bible in prohibition days. Tells the how, where and why to all the alcoholic beverages including such niceties as the right kinds of stills and what to do about chemical analyses.

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Physics

DYNAMIC ETHER—John Griffiths—*Christopher Publishing House,* 112 p., $1.50. The author, called by his publishers "not a scientist," presents an unconventional theory of atomic structure based on the concept that the fundamental unit of all matter is a dynamic particle of ether which is later identified as the proton in its normal state.

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Physics

EXPOSÉS DE PHYSIQUE THÉORIQUE—VOL. XIV—AU DELA L'ÉLECTRON—J. J. Thomson—29 p., 7 fr.; VOL. XV—DIFFRACTION DES RAYONS CATHODIQUES—G. P. Thomson—55 p., 12 fr.; *Hermann et Cie., Paris.*

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Physics

EXPOSES DE PHYSIQUE MOLÉCULAIRE—LE MOMENT ÉLECTRIQUE EN CHIMIE ET EN PHYSIQUE—Jaques Errera—*Hermann et Cie., Paris,* Vol. VIII, 46 p., 14 fr.; Vol. IX, 15 fr.

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